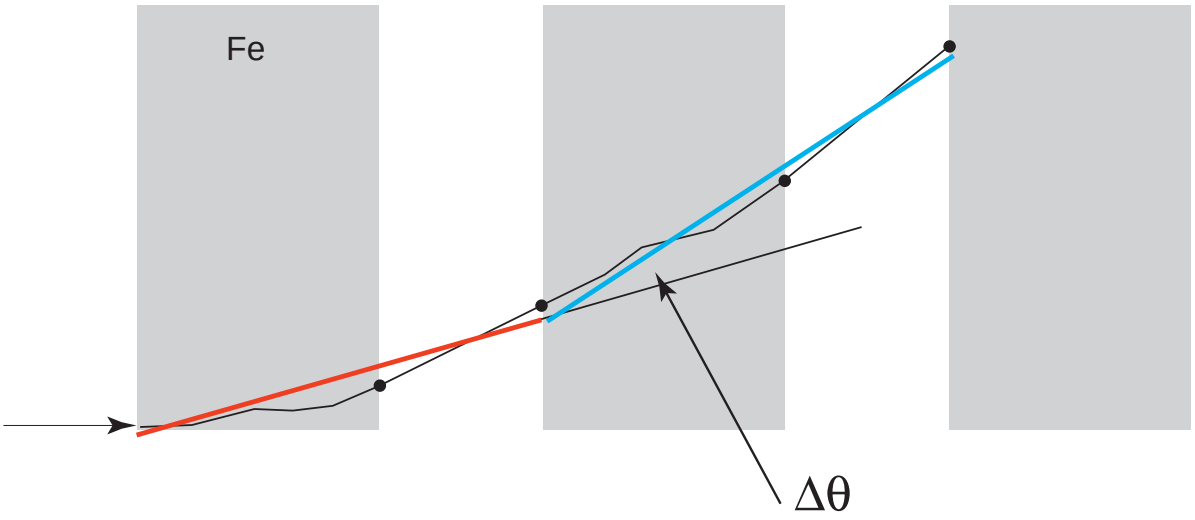
Estimating Momentum using Coulomb Scattering in Emulsion Data

- It is clearly important that we attach a momentum estimate to tracks from the primary and daughter tracks

- It is also clear that in many, often interesting, events tracks are fit with low efficiency

- We will need to rely of other methods, of which scattering measurements will usually be the best

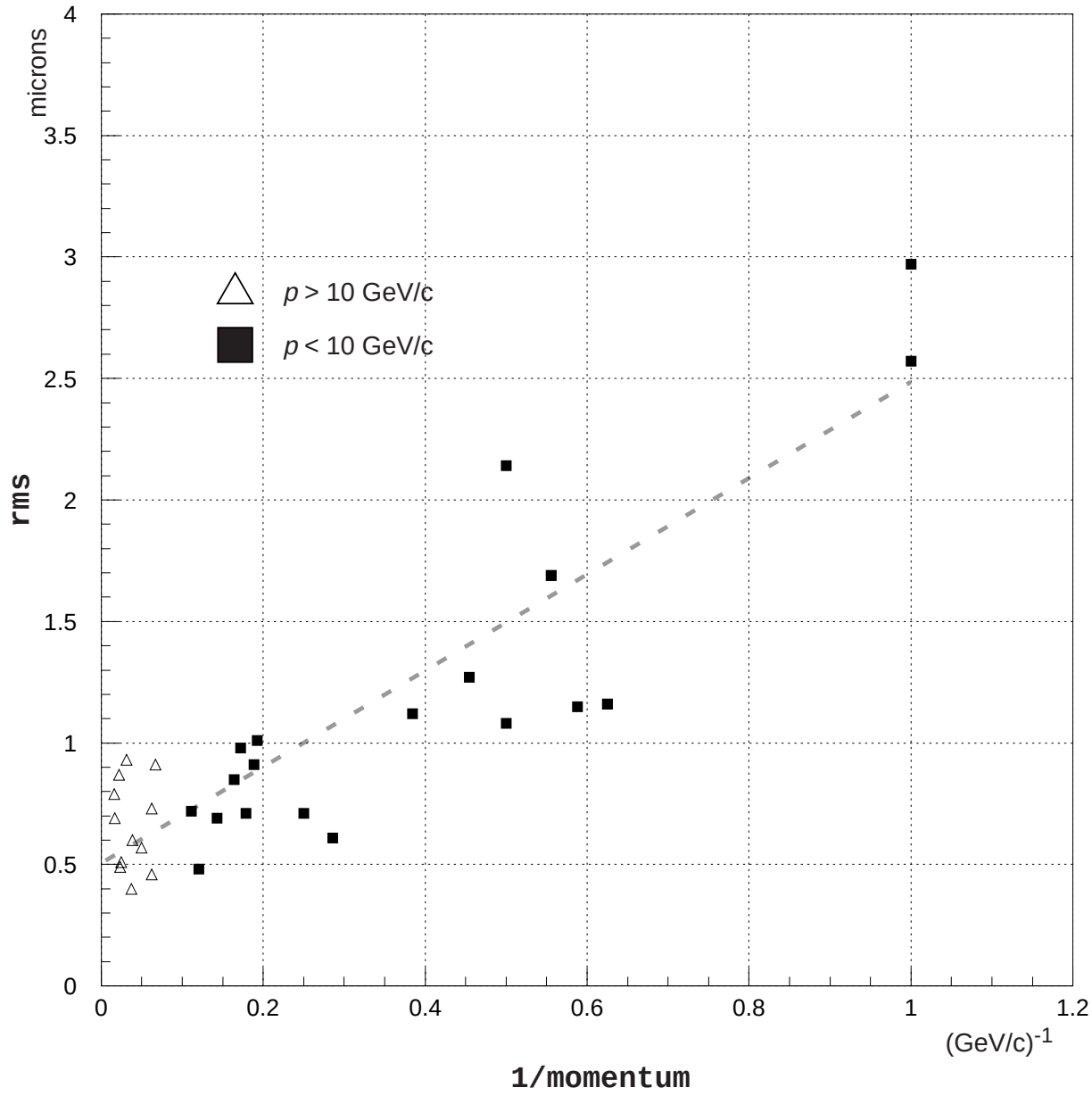
In the following plot, the emulsion coordinate data are fit to a line, 3 points at a time. The difference in angle in adjacent lines is a measure of scattering in a plane



Expect $\Delta\theta_{rms} \sim 0.6\ \Delta\theta_{rms} = 2.0\ mrad$ per (GeV/c)

This result is geometry dependent, ±20%

Compute this *rms* for emulsion tracks from 92 events with "fine alignment" and for the tracks which are well-matched to confirm the correlation between the width of the $\Delta\theta$ distribution and 1/p.


microns
rms
4
3.5
3
2.5
2
1.5
1
0.5
0
0
0.2
0.4
0.6
0.8
1
1.2
p > 10 GeV/c
p < 10 GeV/c
1/momentum
(GeV/c)-1